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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/627,240

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02/09/2007

EXAMINER

DOUGLAS, JOHN CHRISTOPHER

ART UNIT

PAPER NUMBER

1764

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/627,240	Applicant(s) NEWTON, JEFFREY P.	
	Examiner John C. Douglas	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 52-104 is/are pending in the application.
- 4a) Of the above claim(s) 72 and 81 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 66, 88, 92, 96 and 100 is/are allowed.
- 6) ☒ Claim(s) 52, 53, 55-60, 62-65, 67-69, 71, 73-76, 78-80, 82-87, 89-91, 93-95 and 97-99 is/are rejected.
- 7) ☒ Claim(s) 54, 61, 70 and 101-104 is/are objected to.
- 8) ☒ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Examiner acknowledges the response filed on 11/17/2006 containing amendments to the claims, amendments to the specification, and remarks.

Examiner acknowledges claims 1-51, 72 and 81 as canceled, claims 52, 59, 66, 69, 76, 88, 92, 96 and 100 as amended, and new claims 101-104.

Examiner acknowledges that the amendments of claims 66, 88, 92, 96, and 100 overcomes the objection of being dependent on a rejected base claim and are therefore allowed.

Applicant's arguments, see remarks, filed 11/17/2006, with respect to the rejections under references of Koeppel, Senes et al., Leftin et al., and Schreisheim have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 52, 53, 55-60, 62-65, 67-69, 71 and 73-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hettinger, Jr. (US 4450241) in view of Hettinger, Jr. (US 4469588), hereinafter "Hettinger 2" and Zones (US 5958370). Hettinger discloses a catalyst composition for converting heavy hydrocarbons. The catalyst composition contains catalyst particles having a surface area of $100\text{m}^2/\text{g}$ ($1,000,000\text{ cm}^2/\text{g}$), water, and naphtha in a mixture that is to be contacted with the heavy oil (see Hettinger, column 7, lines 34-51, column 8, lines 15-32, column 17, lines 25-34, and column 23, lines 42-45). Hettinger also discloses where the (water, naphtha, and catalyst)/feed ratio is between about 0.01 to 2.0 (where a bbl of feed is approximately 311 lbs of oil) (see Hettinger, column 21, Table E-1). Hettinger also discloses that the catalyst can be mixed with naphtha and water in a riser at atmospheric pressure before contact with the feed. Also, the temperature of mixing would be atmospheric if the catalyst mixture is mixed without regenerated catalyst and before contact with the feed or steam (see Hettinger, column 8, lines 15-32 and column 21, Table E-1).

Hettinger does not disclose a catalyst composition having: silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, titanium dioxide, and a transition metal salt.

Art Unit: 1764

However, Hettinger 2 discloses a catalyst composition containing clay having silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, and titanium dioxide (see Hettinger 2, column 25, lines 10-25).

Hettinger 2 discloses that catalyst containing the clay was more active for cracking hydrocarbons (see Hettinger 2, column 1, lines 38-55).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Hettinger to include a catalyst composition having silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, and titanium dioxide in order to achieve greater cracking of hydrocarbons.

Also, Zones discloses a catalyst with cobalt halide (see Zones, column 9, lines 25-44).

Zones discloses that cobalt halide is a preferred hydrogenation catalyst (see Zones, column 9, lines 25-44).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Hettinger to include a catalyst with cobalt halide because cobalt halide is a preferred hydrogenation catalyst.

2. Claims 76, 78-80, 82-87, 89-91, 93-95, and 97-99 are rejected under 35 U.S.C. 103(a) as being unpatentable Hettinger, Jr. (US 4450241) in view of Hettinger, Jr. (US 4469588), hereinafter "Hettinger 2" and Zones (US 5958370). Hettinger discloses a catalyst composition for converting heavy hydrocarbons. The catalyst composition contains catalyst particles having a surface area of $100\text{m}^2/\text{g}$ ($1,000,000\text{ cm}^2/\text{g}$), water, and naphtha in a mixture that is to be contacted with the heavy oil (see Hettinger,

Art Unit: 1764

column 7, lines 34-51, column 8, lines 15-32, column 17, lines 25-34, and column 23, lines 42-45). Hettinger also discloses where the (water, naphtha, and catalyst)/feed ratio is between about 0.01 to 2.0 (where a bbl of feed is approximately 311 lbs of oil) (see Hettinger, column 21, Table E-1). Hettinger also discloses that the catalyst can be mixed with naphtha and water in a riser at atmospheric pressure before contact with the feed. Also, the temperature of mixing would be atmospheric if the catalyst mixture is mixed without regenerated catalyst and before contact with the feed or steam (see Hettinger, column 8, lines 15-32 and column 21, Table E-1).

Hettinger does not disclose a catalyst composition having: silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, titanium dioxide, and a transition metal salt.

However, Hettinger 2 discloses a catalyst composition containing clay having silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, and titanium dioxide (see Hettinger 2, column 25, lines 10-25).

Hettinger 2 discloses that catalyst containing the clay was more active for cracking hydrocarbons (see Hettinger 2, column 1, lines 38-55).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Hettinger to include a catalyst composition having silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, and titanium dioxide in order to achieve greater cracking of hydrocarbons.

Also, Zones discloses a catalyst with cobalt halide (see Zones, column 9, lines 25-44).

Zones discloses that cobalt halide is a preferred hydrogenation catalyst (see Zones, column 9, lines 25-44).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Hettinger to include a catalyst with cobalt halide because cobalt halide is a preferred hydrogenation catalyst.

Also, Mason discloses that metals may be supported on Portland cement and pumice (see Mason, column 2, lines 15-24).

Mason discloses that Portland cement and pumice are suitable carriers for catalysts useful in the hydrogenation of high molecular weight feedstocks (see Mason, column 2, lines 3-21).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the composition of Hettinger to include that metals may be supported on Portland cement and pumice in order to have suitable carriers for catalysts useful in the hydrogenation of high molecular weight feedstocks.

Also, Mason discloses that cracking increases the API of hydrocarbon oil (see Mason, column 3, lines 40-45 and column 4, lines 15-45).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Hettinger to include an increase in the API of the hydrocarbon feed because cracking causes an increase in the API of a hydrocarbon.

Allowable Subject Matter

3. Claims 66, 88, 92, 96, and 100 are allowed.
4. The following is a statement of reasons for allowance: the prior art does not teach nor disclose a cracking/hydrogenation catalyst containing scoria and cracking conducted at ambient temperature and ambient pressure.
5. Claims 54, 61 and 70 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach nor disclose converting heavy hydrocarbons with a catalyst having: about 15 to 35 wt% silicon dioxide, about 1 to 6 wt% aluminum oxide, about 5 to 20 wt% ferric oxide, about 10 to 30 wt% calcium oxide, at least about 2 wt% titanium dioxide, and at least about 8 wt% transition metal salt.
7. Claims 101-104 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach nor disclose a cracking/hydrogenation catalyst containing scoria.

Response to Arguments

9. Applicant first argues that the teachings of Hettinger would not be combined with other teachings so as to arrive at the claimed invention. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The catalyst requirements are taught in the references of Hettinger 2 and Zones. However, Hettinger 2 discloses a catalyst composition containing clay having silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, and titanium dioxide (see Hettinger 2, column 25, lines 10-25). Hettinger 2 discloses that catalyst containing the clay was more active for cracking hydrocarbons (see Hettinger 2, column 1, lines 38-55). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Hettinger to include a catalyst composition having silicon dioxide, about aluminum oxide, ferric oxide, calcium oxide, and titanium dioxide in order to achieve greater cracking of hydrocarbons. Also, Zones discloses a catalyst with cobalt halide (see Zones, column 9, lines 25-44). Zones discloses that cobalt halide is a preferred hydrogenation catalyst (see Zones, column 9, lines 25-44). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the process of Hettinger to include a catalyst with cobalt halide because cobalt halide is a preferred hydrogenation catalyst.

10. Applicant also argues that Mason uses Portland cement for a different reaction and is not in an aqueous solution. However, Mason uses the Portland cement in a hydrogenation reaction, which is a reaction present in applicant's invention (see Applicant Specification, Field of Invention). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The aqueous solution is taught by Hettinger (see Hettinger column 8, lines 15-33).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Douglas whose telephone number is 571-272-1087. The examiner can normally be reached on 7:30 A.M. to 4:30 P.M..


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1764

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCD

2/4/2007



Handwritten signature of the Patent Examiner, likely a member of the Technical Staff, dated 2/4/2007.